

NORTHAMPTON COUNTY MEDICAL SOCIETY.
—The Northampton County Medical Society held its August meeting yesterday afternoon in the Y. M. C. A. rooms of Easton. There were present Drs. Abernethy, Bachman, D. Engelman, J. P. Engelman, Gotwald, Green, Grower, Hunt, Laubach, Lawall, McIntire, Ott, J. Sandt, A. K. Seem, and A. Seip. Also, Dr. Stabley, of the Dauphin County Society, and Dr. W. M. Baird, of the Warren District Society of New Jersey. The meeting proved to be an interesting one in the discussion of the treatment of various diseases. The Committee on School Hygiene gave a partial report on the lighting of schools, and a supplemental report on ventilation, both of which topics being of so much importance that we publish the report in full.

REPORT OF THE COMMITTEE ON SCHOOL HYGIENE—LIGHTING.

The scientific study of Physiological Optics is of comparatively recent origin, and a rational method of diagnosis and treatment of those affections of the eye which depend upon its optical condition is still more recent. From this fact it is not surprising that a great many cases of such trouble should now be found, which formerly were not recognized, or the trouble assigned to some other cause. But, after making due allowance for the increased delicacy in the methods of investigation, a suspicion arose that cases of ametropia, or faulty vision from imperfect optical condition, were on the increase. Investigations, both in Europe and America, confirm these suspicions to such an extent that it amounts to a demonstration. The condition which seems to be most rapidly on the increase is myopia, or near-sight, and to that condition alone let us confine our attention for the present.

It has been shown that there is a greater proportion of near-sighted persons among educated people. Thus Dr. Lucien Howe, of Buffalo, examined the eyes of 1,008 school children, of whom 19.7 per cent. were myopic. While of "213 cases of eye disease seen during the past year among the paupers of Buffalo, the record shows only 3.5 per cent. to have been near-sighted."

Furthermore it appears that myopia is more prevalent among the higher classes of our educational system than in the lower classes. Thus Dr. C. R. Agnew, of New York, found in the Brooklyn Polytechnic School 10 per cent. of myopes in the academic department and 58 per cent. in the collegiate. It might be said that this is accounted for by the coincidence of the near-sighted scholars keeping on in their studies, while the possessors of normal eyes leave school for other pursuits. But the same results have been obtained in too many observations to make it a mere coincidence. Besides Dr. Haskett Derby, of Boston, found 28 per cent. of the class of '79 of Amherst myopic in their Freshman year; 50 per cent. of whom were more myopic in the following year. And the investigations of one of our committee on the students of Lafayette—as yet incomplete—corroborate the deduction of an increase in the proportion of near-sighted people in the higher classes, by its development in men who previously had optically normal eyes.

Another fact is also patent, that those nations famous for their studious habits have a far greater proportion of myopes in their population. Germany can no longer exempt near-sighted men from military duty. It is safe to conclude that there is a tendency in studious habits to produce near-sight.

Can there be any evil effects resulting from near sight? A few sentences from Donder's "Anomalies of Refraction and Accommodation" will answer this question.

"Every progressive myopia is threatening with respect to the future. If it continues progressive the eye will soon, with troublesome symptoms, become less available, and not infrequently at the age of fifty or sixty, if not much earlier the power of vision is irrevocably lost."

Again: "Not only is the myope not in a condition to discharge all civil duties, not only is he limited in the choice of his position in society, but in the higher degrees myopia leads to disturbance of the power of vision and threatens its subject with incurable blindness."

If these things be so, and Prof. Donder is universally acknowledged as the highest authority, it becomes a very important matter to determine the cause of myopia, the conditions favorable for its increase, and if there be any means of prevention. From the facts stated it would seem that study and near sight in some way bear the relation of cause and effect. In what then do students habits differ from those in other occupations in life? Students are apt to remain for a long time in rooms containing a vitiated atmosphere; with their heads bent over their desks, reading or writing at or near their near point of vision, and keeping their gaze fixed upon the page without relaxation; and this, too, frequently, with insufficient light, which often comes in an imperfect direction. The vitiated air lowers the whole tone of the system—makes it less resistant, so to speak. The position of the head and nearness of the object act conjointly in such a manner as to cause pressure perpendicular to the antero-posterior axis, and the eye does not possess sufficient strength to elongate it in this axis. This will cause the eye to become near-sighted. The insufficient light demands an additional strain upon the eye, aggravating the pressure by making it a necessity that objects to be seen be placed near the eyes.

There is one other cause, which only increases the importance of the subject. Again to quote Donder: "Even on many emmetropic eyes simple tension for near objects has but little effect. In fact the predisposition is almost invariably congenital, and in that case it is, moreover, nearly always hereditary." So that any conditions that are prone to develop near sight, not only puts the possessors themselves on a path that is liable to lead to blindness, but also render the succeeding generations more susceptible to the same causes and more likely to obtain the worst results. The increase of myopia, then, is a subject of great interest to everyone individually, of equal importance to the body politic. The requirements of modern life will not allow us to go back to the old days of general illiteracy; the comfort of the individual and the strength of the State demand a race of people with normal eyes.

A remedy must be found, and, because of the new conditions, it is no reflection on the wisdom of the fathers should this remedy cause an innovation in time honored methods. If this increase of near sight is due to school life, we must either modify the condition of school life to prevent this increase or permit the illiterate to become the only healthy people in the nation.

Thus far we have confined our thoughts to myopic eyes. Does faulty hygienic conditions work in only in this class of eyes? We think not. It is a well determined fact that most cases of squint are due to that optical condition of the eye known as hypermetropia or over sight, a condition directly opposite to that of near sight. We think that the extra strain frequently put on the eye in school life is the immediate cause of many a case of squint. And when we consider that so many cases of squint are neglected, finally causing blindness of the deviating eye, it is not a slight additional grievance. Besides the optical troubles mentioned there are many of the unclassifiable cases of asthenopia which have their cause, or are made worse from faulty hygienic conditions in school life. The subject then is of sufficient importance to warrant this lengthy discussion, and the question of remedy should receive our closest attention. We have asserted a triple cause—poor ventilation, improperly constructed seats and desks and imperfect lighting—to which may be added a fourth, improper methods of study. In regard to ventilation, a previous report has already shown how deficient are our schools; the matter of seats, &c., is reserved for another report. Our inquiry has not extended into the methods of study, so there remain for present consideration only the subject of lighting. The subject divides itself into two topics. A, The direction of the light; and B, The amount of light. The first division is sub-divided into two: First, What direction should the light come in relation to the scholar, i. e., from his left or right side; from the back or front; and Secondly, the angle that the light should fall upon the desk; whether low down or high up approaching the vertical. Let us consider them in the order proposed. What relation should the direction of the light bear to the scholar? We want the page illuminated, and not the eyes of the scholar; we want it uniformly lighted, and not covered with fixed or moving shadows. These propositions are so evident that it is not necessary to discuss them. The light then should not come from the front, that is indeed the worst direction, and should always be condemned. Shadows will be thrown upon the page if the light comes from the right hand side or from the back; these directions are therefore objectionable, while light from the left is nearly or quite free from these objections, and is the one which should be had in all cases if possible. If it is objectionable to have shadow from one direction, it is more so to have them in two; and cross lights in many instances to be over care-

ful. But one must remember that the scholar remains hours a day, for weeks in succession, using its eyes to a maximum degree, and what would be of no moment were it to act for an hour, becomes a subject of great importance under existing circumstances, and this thought applies to the whole discussion. As to the angle at which the light should fall on the desk. Here again the shadows cast will be an important factor. The smaller they are the better. So the greater the angle the better. Light which is parallel to the desk top or nearly so is of very little or no use, and on account of its liability to shine into the eyes of the scholars is apt to do harm. Consequently our windows should be placed as near the ceiling as possible, and should not extend too near the floor. The higher the light enters, the more good is obtained from the reflection of the light from the ceiling. Whether skylights would be preferable or not is not determined, the bulk of the opinion being, however, that high lateral light is preferable to light from above.

As to the second question, "how much light should be furnished?" we must not be guided by what we think to be enough light for a dwelling, for then if the day be dark, or a fine piece of work to be done, we can move closer to the window. In schools, however, it is different, and a much greater amount of light must be provided. We do not think, however, with Dr. Herman Cohn, of Breslau, who, in his report on School Hygiene, at the Paris Exposition of 1875, asserts that a school room cannot be too well illuminated, and recommends one square meter of window area to one square meter of floor space, although he places his minimum at his previous standard of one to five. There can be an excessive amount of illumination, i. e.,—an amount that will have to be excluded at all times by means of blinds or curtains. What relation, then, should the window area bear to the floor space? Dr. Lincoln suggests 1 to 6; Dr. Cohn, as we have already said, 1 to 5. Other authorities say 0.200 to 0.225 square meters of glass to every scholar, which would amount to about the same thing. Dr. Loring does not think the light can be in excess if means are provided to subdue it at times.

In our criticism of the schools of the county we took for our standard the following resolution offered to the Brooklyn Board of Health by the Sanitary Committee, in June, 1877. We adopt this because they are the results arrived at by careful men, and they are conservative rather than the reverse.

3. *Resolved*, The situation and area of windows of every school room hereafter to be constructed or provided shall be as follows: No window shall be less than three feet six inches (1.1 m.) from the floor, exclusive of the frame, nor more than ten inches (0.225 m.) from the ceiling, including the frame; and the area of the window space, clear of the frame, shall not be less than one-sixth or more than one-fifth of the area of the floor space. And with regard to the direction from which the light should fall on the pupils, the windows and seats of all the class rooms shall be arranged, preferably, in the following order: first, from the left; second, from the back; and third, from the right. In no case shall the windows and desks be so arranged or permitted as to allow the light to strike the pupils directly in front.

In our tables we give first the school, then in the next column the number of windows, then the total area of window space, its ratio to the area of floor space, whether this ratio is above or below our standard, the direction of windows follow, and criticisms upon this direction. As all light facing the scholar should be excluded, the area of the windows in this position are then given. This is followed by the height of the sill, and if the windows be too low, the area of window 1.1 under is stated, these 2.2 areas deducted from the total area of window space, give the next column or proper area of window space, the ratio to the floor space is then given and then whether this corrected area is above or below normal. The next column gives the distance of the top of the windows from the ceiling while the last column is devoted to remarks.

[Here follows the tabular statement of the schools of the county whose measurements are in the hands of the committee, under the above heading. The report then continues.]

From a careful examination of the above statistics, the following tables have been arranged. We have separated the schools of Easton from the others, because it is a separate school district; we have, however, given a column which comprises all the reports sent us. The aggregate number varies, because in some of the tables we include the "class rooms," in others they are excluded:

TABLE I.
Showing the amount of light furnished the schools without making any deduction whatever.

	Easton.	Rest of the County.	Entire County.
No. of schools having more than the standard amount of light.....	51	25	31.5
No. of schools having the standard amount.....	22	25	31.5
No. of schools having less than the standard amount of light.....	13	27	37
Total.....	49	79	128

That is, one-third of the 128 schools and class-rooms reported are not provided with enough light.

TABLE II.
showing the proportion of schools in which there are windows facing the pupils:

	Easton.	Rest of the County.	Entire County.
No. of schools examined.....	35	75	110
No. of schools having windows facing the pupils....	7	31	38
Per centage.....	20	41	34

There are, in addition, four school rooms reported from the county, which have their seats arranged around the walls, so that some of the scholars have good and others poor light. Excluding these, one-third of the schools are faulty in the above table.

TABLE III.
showing the proportion of school-rooms in which there is cross light:

	Easton.	Rest of the County.	Entire County.
No. of schools examined.....	35	75	110
No. of schools in which there is a cross light.....	13	48	61
Per centage.....	37	64	55

TABLE IV.
showing the proportion of schools having the sills of the windows sufficiently high:

	Easton.	Rest of the County.	Entire County.
No. of schools examined.....	35	79	114
No. of schools with sills of proper height.....	22	5	27
Per centage.....	63	7	24

or less than one-quarter of the schools come up to the standard in this respect. Quite possible the subject was never thought of, and these that are right only happen to be so.

TABLE V.
showing the amount of light furnished the schools after deducting that which enters the windows facing the pupils, and that which enters too low:

	Easton.	Rest of the County.	Entire County.
No. of schools having more than the standard amount of light.....	16	9	11.5
No. of schools having the standard amount of light.....	5	14	22
No. of schools having less than the standard amount of light.....	14	48	62
Total.....	35	79	114

Or more than one-half of the schools reported have not a sufficient amount of proper light.

TABLE VI.
Showing the proportion of windows whose tops are near enough the ceiling.

	Easton.	Rest of the County.	Entire County.
No. of schools examined.....	35	79	114
No. of schools whose windows are high enough....	6	9	15
Percentage.....	17	11.4	13

Evidently this was not taken into consideration at all in the erection of the buildings. An examination of the statistics also show that there is not a single school room of the 114 which does fall in some of the conditions that were formulated as our standard. Some indeed very slightly, and in a manner that can be easily remedied; but we are unable to point to one of them as a model.

We desire to call attention to the following school rooms as especially bad:

Easton—First Ward.—The Grammar Schools. These are situated in the third story of the school building at the corner of Fourth and Ferry streets. In order to obtain additional light there are glass partitions between the school room and the class room. As a method of lighting this is always objectionable. But even supposing all the light which enters the class room came into the school room, which is impossible, the total amount of light is still too small, while the proportion of proper window area supplies to the floor space is only 1 to 18.4, or not quite one-third what it should be.

Easton—Sixth Ward, primary, 1, B., is insufficiently lighted and should be condemned.

South Bethlehem.—All the schools reported from this place are, without exception, poorly lighted.

Bath.—The secondary school has a proportion of 1 to 13.8 and the primary of 1 to 21.2, instead of 1 to 5 or 6.

In Lower Nazareth, the Hecktown school,

and in Plainfield, Teel's school are likewise insufficiently lighted.

In Palmer Township the Lincoln, Fremont, Polk and Franklin schools have the seats arranged around the sides of the room facing the walls. In this arrangement quite a number of the scholars will receive their light from an improper direction, and we think these schools too should be condemned.

We confess that we are surprised at the result of our investigation, being much worse than we anticipated even while we were arranging the statistics, and the question arises, What can be done to improve the condition of our schools in this respect?

As the question will come up again as a conclusion to the whole series of reports, but one or two suggestions will be made. There is evidently a lack of knowledge upon the subject, and some means should be taken to impart the desired information. A carefully prepared lecture or two at the Teachers' Institute might give the proper ideas, and so insure that the school rooms constructed hereafter shall be perfect in this respect. Those persons whose eyes are in any way abnormal should have seats given to them in school which will be least liable to injure their eyes. When the time comes that every child entering our schools will be examined by a competent physician, and their place in the school room determined by their physical condition, especially of their ability to see and hear, this scheme will become practicable. Until that time everyone who suspects their school children patients to have faulty vision, should accompany the child and request the teacher to place it in the proper place in the school room.

[Should anyone desire to know the reported condition of any one school, they can obtain the information by addressing a letter to the Secretary of the Northampton Medical Society, Easton Pa., enclosing a stamp to pay return postage.]

SUPPLEMENT TO THE REPORT ON VENTILATION OF THE COMMITTEE ON SCHOOL HYGIENE.

Since our report on ventilation there has been a change made in the academy building in the Sixth Ward, of Easton. It seems that the second floor is insufficiently heated while there is an excessive amount of heat on the first floor. To equalize this, a hole 0.504 M. by 0.338 M. has been cut through the ceiling and lined with tin, so that the excess of heat can pass from the lower room to the upper. We have no doubt that it will be an effectual method of equalizing the temperatures, since the difference of a single degree between the temperature of the lower room and that of the upper (and there must be at least that much or it could not be perceived by the senses) will cause quite a current of warm air to ascend. But when we inquire into the composition of the air, we do not find so much to commend. When we remember that the means of ventilation in that building is very deficient, and that the openings of the ventilating flues are near to the floor, it is easily seen that the impure air from the lungs of the children in the school below will have an avenue of escape through the opening into the room above before it has time to diffuse itself. Consequently the room above will be vitiated by the foul air of its own production not only but by that of the school below as well. Perhaps in full justice it should be said, that we understand that the original plan contemplated carrying a pipe of the size of the opening up through the upper room to within three feet of the ceiling. Had this plan been carried out there would have been another example of entire ignorance of the very first principles of the laws of nature, hiding itself under complicated appliances, for as soon as the foul air enters the room it will begin to diffuse itself and if there is no means of carrying it off in a current, will, in a very short time, be equally distributed throughout the room. The whole arrangement we must denounce as a piece of criminal carelessness; for when such death traps are made it will not do to mince words. And should there happen, among the scholars of these schools, any cases of the preventable diseases, resulting fatally, those who have the responsibility in this are morally guilty of the murder of these children, without the cause can be clearly traced to some other source, and even then we think they would be accessories to the act by debilitating the children with the poisoned air and thus hindering their recovery.